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EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
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19. 11. 98

Applicant's or agent's file reference

AMD/C70237

IMPORTANT NOTIFICATION

International application No.

PCT/EP 96/04807

International filing date (day/month/year)

04/11/1996

Priority date (day/month/year)

03/11/1995

Applicant

SMITHKLINE BEECHAM P.L.C. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

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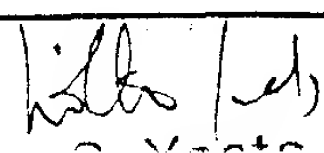
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference AMD/C70237	<div style="display: flex; justify-content: space-between;"> FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) </div>	
International application No. PCT/EP 96/ 04807	International filing date (<i>day/month/year</i>) 04/11/1996	Priority date (<i>day/month/year</i>) 03/11/1995
International Patent Classification (IPC) or national classification and IPC C12N15/82		
Applicant SMITHKLINE BEECHAM P.L.C. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
 2. This **REPORT** consists of a total of 3 sheets, including this cover sheet.
- ☒ This report is also accompanied by **ANNEXES**, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consists of a total of 2 sheets.

3. This report contains indications and corresponding pages relating to the following items:
 - I ☒ Basis of the report
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 27/05/1997	Date of completion of this report 19.01.98
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

I. Basis of the report

1. This report has been drawn up on the basis of (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.):

☐ the international application as originally filed.

☒ the description, pages 1-50 _____, as originally filed,
pages _____, filed with the demand,
pages _____, filed with the letter of _____,
pages _____, filed with the letter of _____,

☒ the claims, Nos. _____, as originally filed,
Nos. _____, as amended under Article 19,
Nos. _____, filed with the demand,
Nos. 1-16 _____, filed with the letter of 8.8.1997,
Nos. _____, filed with the letter of _____,

☒ the drawings, sheets/fig 1-10 _____, as originally filed,
sheets/fig _____, filed with the demand,
sheets/fig _____, filed with the letter of _____,
sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____.
☐ the claims, Nos. _____.
☐ the drawings, sheets/fig _____.

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims 1-16	YES
	Claims	NO
Inventive Step (IS)	Claims 1-16	YES
	Claims	NO
Industrial Applicability (IA)	Claims 1-16	YES
	Claims	NO

2. CITATIONS AND EXPLANATIONS

1. The claims relate to a process for isolating a promoter functional in transgenic blackcurrant and other non-climacteric fruit, to the promoters thus isolated, to their use, to cDNA corresponding to the genes from which the promoters are derived, to the proteins encoded by the cDNA, and to vectors, cells and plants containing the promoters or cDNA. This subject-matter is novel with regard to the cited documents. It is further regarded as inventive since the available prior art does not disclose or render obvious any blackcurrant-derived promoters.

CLAIMS

1. A process for isolating a promoter capable of driving fruit-specific expression of DNA sequences in transgenic blackcurrant and other non-climacteric fruit comprising
 - a) isolating mRNA from ripening blackcurrant fruit
 - b) preparing a cDNA library from the isolated mRNA
 - c) differentially screening the library from b) to identify genes expressed during the ripening periodand
 - d) screening a genomic library with probes prepared from cDNA identified according to c) to isolate the corresponding gene and its promoter region.
2. A promoter capable of driving fruit-specific expression of DNA sequences in transgenic blackcurrant and other non-climacteric fruit obtainable by the process of claim 1.
3. A promoter according to claim 2 which comprises the sequence of nucleic acid bases in Figure 9 or IDSEQ 11 (the RIB1 gene promoter) or IDSEQ 14 (the RIB 7 gene promoter)..
4. Promoter DNA sequences which hybridise to the DNA of claim 3 under conditions of high stringency.
5. cDNA for genes which exhibit differential expression in fruit during the ripening period of fruit development selected from pRIB1 (IDSEQ 1), pRIB3 (IDSEQ 3), pRIB5 (IDSEQ 5), pRIB6 (IDSEQ 7) and pRIB7 (IDSEQ 9).
6. DNA encoding the RIB1 or RIB 7 gene.
7. A vector comprising the DNA as claimed in any one of claims 2 to 6.

8. Use of a promoter according to claim 2,3 or 4 to control the expression of one or more genes in climacteric or non-climacteric fruit.
9. Use according to claim 8 wherein the non-climacteric fruit is blackcurrant.
10. Use of a promoter according to claim 2,3 or 4 in the transformation of plant cells.
11. Plant cells and plants transformed using a promoter according to claims 2,3 or 4 or a vector according to claim 7.
12. Plants comprising cells according to claim 11 and descendants thereof.
13. Plants and seeds according to claim 12 which are blackcurrants.
14. Use of the plants or seeds of claims 12 or 13 in the manufacture of fruit products.
15. A process according to claim 1 wherein the method for extracting nucleic acid from blackcurrant fruit comprises homogenising by pulping blackcurrant fruit in a buffer containing insoluble polyvinylpolypyrrolidone.
16. Proteins encoded by the DNA sequences of claims 5 or 6.

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C12N 15/82, 5/10, A01H 5/00, C07K 14/415	A1	(11) International Publication Number: WO 97/17452 (43) International Publication Date: 15 May 1997 (15.05.97)
(21) International Application Number: PCT/EP96/04807 (22) International Filing Date: 4 November 1996 (04.11.96) (30) Priority Data: 9522558.7 3 November 1995 (03.11.95) GB (71) Applicant (for all designated States except US): SMITHKLINE BEECHAM PLC [GB/GB]; New Horizons Court, Brentford, Middlesex TW8 9EP (GB). (72) Inventors; and (75) Inventors/Applicants (for US only): WOODHEAD, Mary, Rose [GB/GB]; Scottish Crop Research Institute, Invergowrie, Dundee DD2 5DA (GB). TAYLOR, Mark, Andrew [GB/GB]; Scottish Crop Research Institute, Invergowrie, Dundee DD2 5DA (GB). BRENNAN, Rex, Michael [GB/GB]; Scottish Crop Research Institute, Invergowrie, Dundee DD2 5DA (GB). (74) Agent: DENHOLM, Anna, Marie; SmithKline Beecham, Corporate Intellectual Property, Two New Horizons Court, Brentford, Middlesex TW8 9EP (GB).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: BLACKCURRANT PROMOTERS AND GENES (57) Abstract Promoters and a process for isolating a promoter capable of driving fruit-specific expression of DNA sequences in transgenic blackcurrant and other non-climacteric fruit.		

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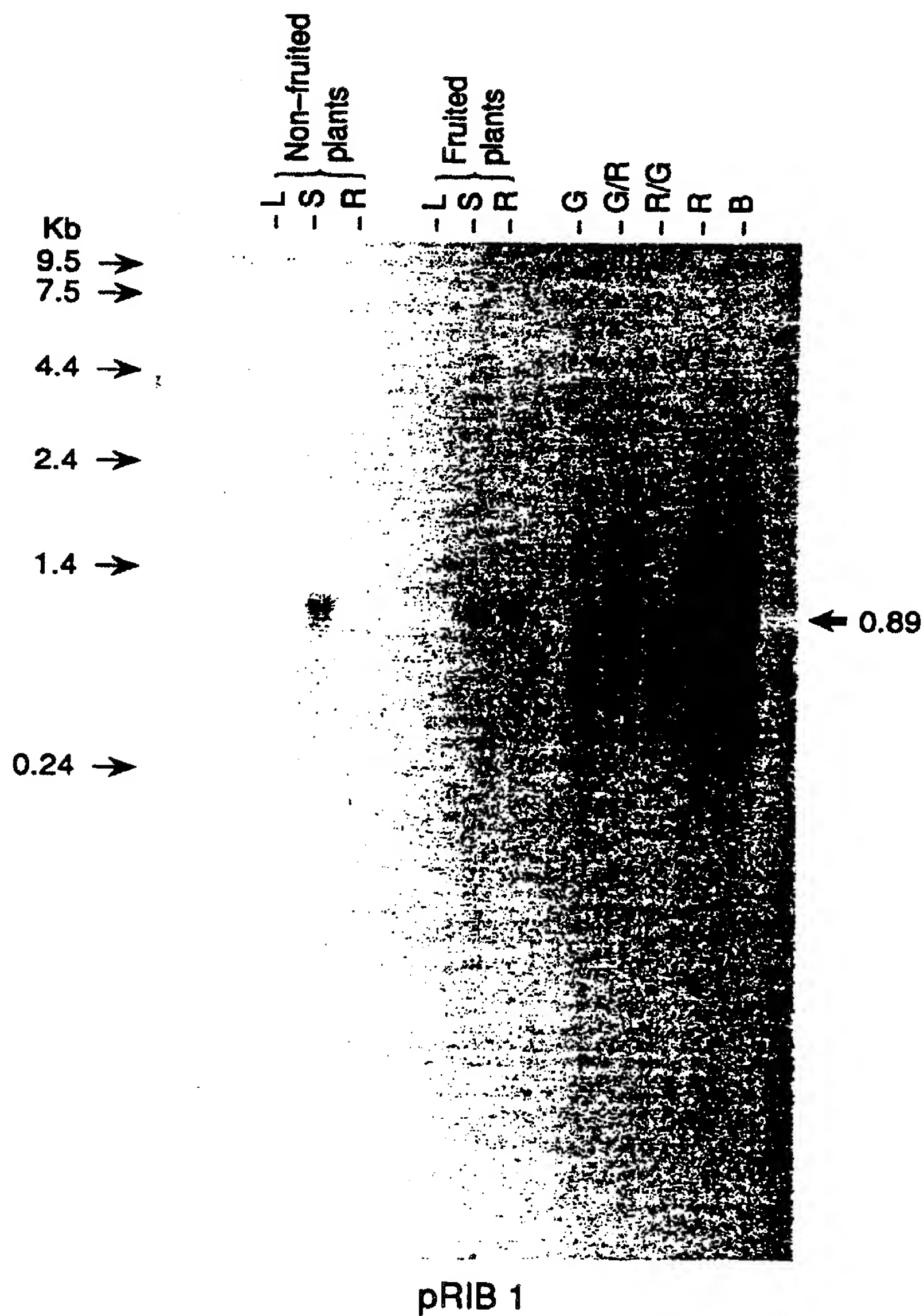


Figure 1

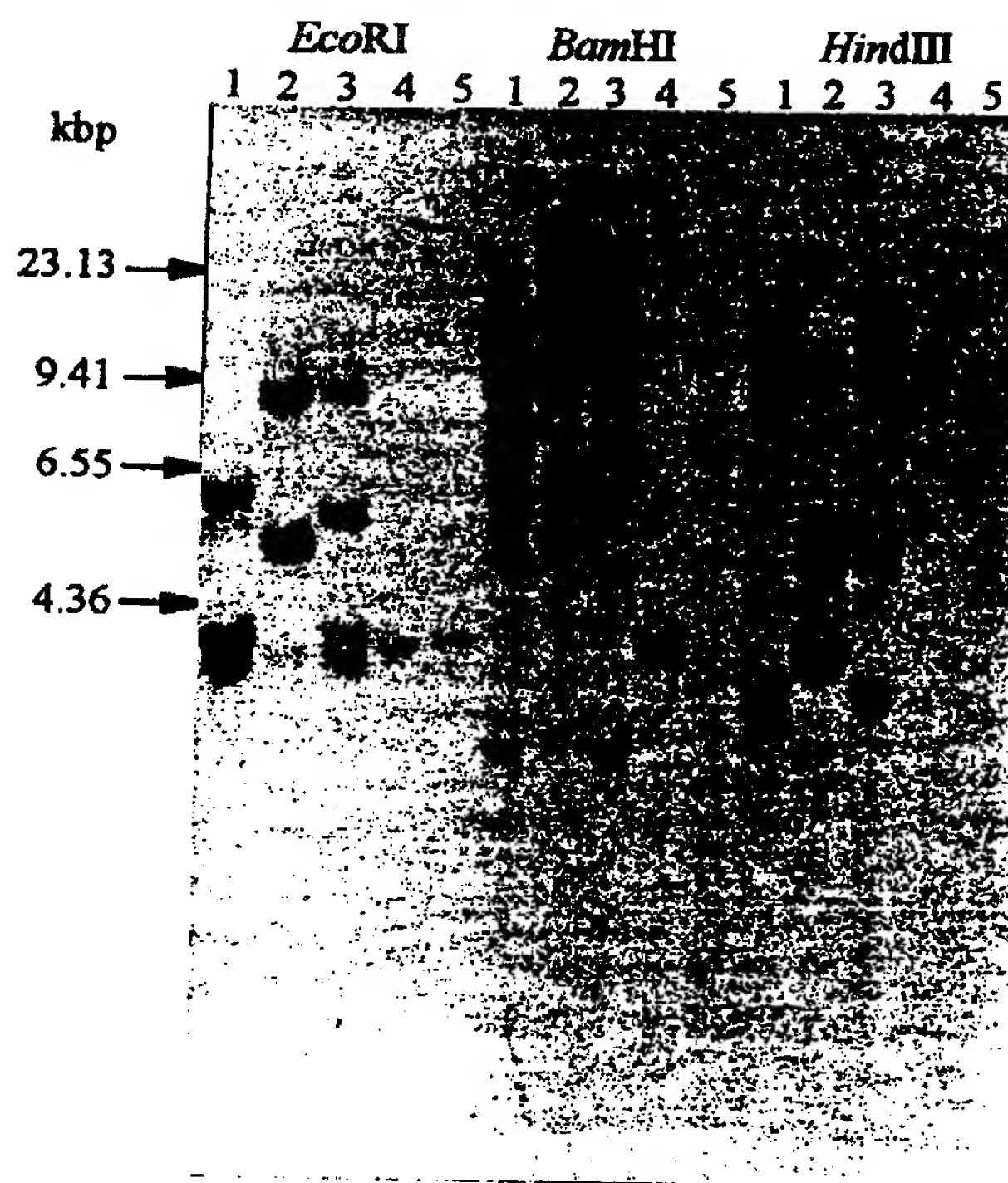


Figure 2

1 CAGCATTCCA AGAGGAAAAA AAACATGATC AAGAAGTAAT TACTACAAAA
51 GAGGAAGCTG TAGTAGTAAC TGCACCACCA CCATCAGAAA CAGCAGAGCC
101 AGCTGCAGCT GTTGTGCGG AGGAAGAGAC AACAAAGGAG CAAGAAGAGC
151 CGCCAGCAGT ATCGGCCGAG GAACCTGTGG CCCAGCTGA AGTAGAGACA
201 AAGGTGGAAG TTACAGAAGA ACCACCAAAA GTTGAGGAGA AACCAGCAGA
251 AGTAGAGGAG GCTCCAAAGG AAACAGTAGA AACAGAACCA GCTGTTGAGA
301 AGACCATCAA GGAGGAAACT GTAGAGGACT CTGTCGTGGC ACCTGCTCCC
351 GAACCGGAAG CCGAAGTCCC AAAAGAGAAG GTAATTGCTA CTACTGAAAC
401 TACTGAGGAA GAAGAAAAAG TGGCAGTTGA AGAAGTTGAA GTGAAAGTTG
451 AAACAGAGGA GGGAGAAGTT ACTGAGGAGA AGACTGAGTA AAATAAGTTG
501 TACAACTATT TTATGCACGC CTTATTTTCT CAATTGGAAG TTTATAATGT
551 AGTGGGCTTT TGGTAATATT TGGGGGTTTA ATAAGTGGTT TAAGTGGGTT
601 AAGGCTTTTT TGAATTTAG ATATTGGGT AAAGGCCTAC TTGAACAAAA
651 CATAGAAATT TGGCACACAT GGGTAAAAGT CAACTTTGT TGAGGATGTT
701 TTCTTGTTGG TTAAATGTGT GTGCCAAGTA GTAGAATGTG GTGGTTGTAA
751 TGTAAGTTCT CAAGTAGGGT TTATGAGTCC TAGTATTATG CTTGATTGTA
801 TGTTGATATG AAAATGGGGG TATGTTGGCT TTGAATAAAA GTTTTAAATT
851 TTATAAAAAA AAAAAAAAAA AAAAAAAAAA AA

Figure 3

1 AFQEEKKHDQ EVITTKEEAV VVTAPPPSET AEPAAAVVAE EETTKEQEEP
51 PAVSAEEPVA PAEVETKVEV TEEPPKVEEK PAEVEEAPKE TVETEPAVEK
101 TIKEETVEDS VVAPAPEPEA EVPKEKVIAT TETTEEEKV AVEEVEVKVE
151 TEEGEVTEEK TE

Figure 4

1 AAACAACAAACTTTTTTCATCAATCTTCTTTCTTTAATCATCACCATGTCGAGCTGCGGAA 60
T T N F F I N L L S L I I T M S S C G N

61 ACTGCGACTGTGCCGACAAGACCAACTGCCCAAAGAAGGGAAACAGCTACGGCTTTGACA 120
C D C A D K T N C P K K G N S Y G F D I

121 TCATTGAGACCCAGAAGAGCTACGATGACGTCGTGGTGATGGATGTTTCAGGCAGCTGAGA 180
I E T Q K S Y D D V V V M D V Q A A E N

181 ATGATGGCAAGTGCAAGTGCGGCCCGAGCTGCAGTTGTGTGGGCTGCAGCTGTGGTCATT 240
D G K C K C G P S C S C V G C S C G H *

241 AAGTTAAACACAACATTATCATGTTATAGTGAATAATGATGTGTGTGATGAATATAGGTG 300
301 AAAAATCTGTGGTGTGATAAAAACCGTTGGTGAATAAATAGGTGTATATTTTCGTGTGCAC 360
361 CTTCTACGAGTACTTGTGCTTGTTGGGTGAAAGAAATATGCACCTAAGTGTGAGTTGTTT 420
421 TCCGTGTTTTTCGCCGTGTCCCTTGTAATGGTCATGTTTGTGTTTTCTTGTGGTTAAATT 480
481 AAATGAACTAGTAATGTTATGTAAAAA 519

Figure 5

1 GGAGGAGATCACCAGTTCCACCAACACGTCGTCGTAATGAGACACGGCGATCGGATAGAC 60
R R S P V P P T R R R N E T R R S D R Q

61 AACTTCGAGCCACTGTGGGTGAAGACGGCGGCGAACGATGGGACCCACCCTTGGTCGATG 120
L R A T V G E D G G E R W D P P L V D E

121 AAGGCAAGCTCCGTACCTTCCGGACAGGTCTGAAGCTCCGAACCAATTTTGATTTTCCGA 180
G K L R T F R T G L K L R T N F D F P I

181 TCCATCGTGTCTTTGTATCACCTTTCCTCCGGTGCGTACAGACAGCATCGGAAGTCATCT 240
H R V F V S P F L R C V Q T A S E V I S

241 CCGCTCTCTGCGCCGTCGACGATATTCCCGCCACCCTAATAGAGGCGATCAAGTACAAA 300
A L C A V D D I P A T T N R G D Q V Q I

301 TCGATCCATCCAAGATCAAGGTCTCTATTGAGTATGGATTATGTGAAATGTTGAACATGC 360
D P S K I K V S I E Y G L C E M L N M Q

361 AAGCCATAAGACTTGGTATGGATTTTCAGCAATGGGAATTGGGGTTTTCGATAAATCACACC 420
A I R L G M D F S N G N W G F D K S H L

421 TTGAATCAACATTCCCAGTTGGGACGGTGGATCATAGTGTGGAACCACTCTATAAAGAGA 480
E S T F P V G T V D H S V E P L Y K E M

481 TGCCAAAATGGGAAGAGACAGTCAATGGCGCAAGGGCCAGATATGAAGAGGTTATTTCAGG 540
P K W E E T V N G A R A R Y E E V I Q A

541 CCCTAGCAGATAAATACCCACGGAGAAGCTTGTGCTTGTTACACATGGGGAAGGAGTTG 600
L A D K Y P T E N L L L V T H G E G V G

601 GCGTTGCAGTTTCTGCCTTCATGAAGGATGTTACAGTGTACGAAGCCGATTATTGTGCCT 660
V A V S A F M K D V T V Y E A D Y C A Y

661 ATACACACGCAAGAAGATCCATTGTCTTGGGCAAAAACCAGTCATTTACTGCTGAAAAC 720
T H A R R S I V L G K N Q S F T A E N F

721 TTGAAGTATTACCAAAAACAAGGCCAAACTGGTGTGAGTTACGTCTTGAACAGCATTGAT 780
E V L P K Q G Q T G V S Y V L E Q H *

781 GGAAGTGTATGACCTAATTGTGGCAGCCGATGATTACAGAAACAATTTCCACACCTTTTT 840
841 TCTTTTTTTCGGGCATTTGCCTACATTTTATAATTAATTAGGCATTCTCATAGCTAAGGCT 900
901 CATTGGATTACATCCCTACTTGTTTAAAGGAGACTTTGATTTGTTGCCTCCAAACAGAA 960
961 CATATGTTGCTGTGTCCATCAGCTTTTTTTTAACTGGGATTTCTATTTTACAGTGTGTAA 1020
1021 AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA 1046

Figure 6

1 GTTGATGGCAGATGTGACCAACTCAGGAAAAATGCCAGGGTTGTTGCAATTGATTCTTAC 60
V D G R C D Q L R K N A R V V A I D S Y

61 GAAGATGTTTCCTTTGAACGATGAGAACGCATTGAAAAAGGCAGTGGCTAGTCAGCCTGTG 120
E D V P L N D E N A L K K A V A S Q P V

121 CGCGTCGCCATTGAAGGAGGTGGCAGGGATTTCCAACCTCTATCAATCAGGCGTCTTTACT 180
R V A I E G G G R D F Q L Y Q S G V F T

181 GGATCATGTGGGACGGCCCTAGACCATGGTGTGGCTGCTGTTGGGTATGGCACAGAAAAT 240
G S C G T A L D H G V A A V S Y G T E N

241 GGTGTGGATTACTGGATTGTAAGGAACTCATGGGGTGCAAGCTGGGGAGAGAGCGGCTAC 300
G V D Y W I V R N S W G A S W G E S G Y

301 ATCAGGATGGAACGTAATCTGGCAGGCACAGCTACGGGCAAATGTGGTATTGCAATGGAA 360
I R M E R N L A G T A T G K C G I A M E

361 GCCTCTTACCCTATTAAGAAAGGCCAAAATCCCCCAAACCCAGGACCATCTCCTCCATCT 420
A S Y P I K K G Q N P P N P G P S P P S

421 CCAATAAAGACCTCCAACAGTTTTGTGACAATTACTATACCTTGGCTGAAAGCACCCTT 480
P I K T S N S F V T I T I P W L K A P L

481 GCTGCTGTCTATTTGAGTTTGGCAGGTATTGCTTCGAGTGGGGATGTTGCCCACTCGAGG 540
A A V Y L S L A G I A S S G D V A H S R

541 CTGCCACTTGCTGTGATGACCATTACAGTTGCTGCCCCACATGAGTATCCCATCTGCAACC 600
L P L A V M T I T V A A H M S I P S A T

601 TTAATGCAGGGACGTGTATGATGAGAAGGACAACCCATTGAGTGTGAAGGCATTGAAGCG 660
L M Q G R V *

661 TACTCCCGCTAAACCTCATTGGGCCTTTGGGAACCGTGGCAAGAGCAGCAGTGCTTAAGA 720
721 ACATTGTGTCATCTATACAGTGAAAGTAAACGAGGATGAAAAGTTGTATCAGGCAGGGC 780
781 TTGATGATCTCCTCGGTTTTATAGTACCGCATACCCTCATTCTCCATTAAGGTCATATAC 840
841 ATATGGACGGTTTATCAAAGTTTATTCAGATGCTAATTATGTATATATCATTCTCAGTC 900
901 TTTGTATTTTCAATTTTAAACGAGAACATAAACAGATCGTTATCAGCTACCAATTTCCACTGT 960
961 AAATCACGTTATCAATTATTTACTGGCCTCGCTGAAAAAAAAAAAAAAAAAAAAAAAAAAAA 1017

Figure 7

1 CGGTTCAATCGCTGGATCAATCGAGCATATGGCGATGTATCCGGTTGATACGCTTAAAC 60
G S I A G S I E H M A M Y P V D T L K T

61 TCGCATACAGGCTATTGGGTCATGTTCCGGCTCAATCCGCCGGTCTCCGACAAGCCCTTGG 120
R I Q A I G S C S A Q S A G L R Q A L G

121 GTCGATACTGAAAGTTGAAGGTCCCGCCGGACTTTACCGTGGCATTGGTGCAATGGGTCT 180
S I L K V E G P A G L Y R G I G A M G L

181 CGGTGCAGGACCAGCTCACGCAGTGTATTTCTCCGTTTACGAGATGTGTAAGGAGACTTT 240
G A G P A H A V Y F S V Y E M C K E T F

241 TTCTCATGGTGATCCGAGCAATTCCGGTGCGCACGCCGTTTCGGGGGTGTTCCGCGACGGT 300
S H G D P S N S G A H A V S G V F A T V

301 GGCAAGCGACGCGGTGATTACGCCGATGGATGTGGTGAAACAGAGGTTGCAGTTGCAGAG 360
A S D A V I T P M D V V K Q R L Q L Q S

361 CAGTCCGTACAAGGGTGTGTTGATTGCGTGAGGAGGGTGTGGTAGAAGAAGGGATTGG 420
S P Y K G V V D C V R R V L V E E G I G

421 CGCATTTTACGCATCTTATCGAACAACGTGGTGCATGAATGCCCCGTTTACGGCCGTTCA 480
A F Y A S Y R T T V V M N A P F T A V H

481 CTTCCGCCACATATGAAGCCACGAAGAAAGGGTTGTTGGAGGTGTCGCCGGAGACTGCGAA 540
F A T Y E A T K K G L L E V S P E T A N

541 CGATGAGAATTTGTTAGTGCATGCTACTGCTGGTGTCTGCTGCTGGAGCTTTGGCTGCAGT 600
D E N L L V H A T A G A A A G A L A A V

601 AGTAACCACTCCACTAGATGTTGTCAAACTCAGTTGCAGTGCCAAGGTGTTTGCGGATG 660
V T T P L D V V K T Q L Q C Q G V C G C

661 CGACAGATTTTCTAGCAGTTTCGATTTCAGGATGTTATAGGAAGCATAGTGAAGAAAAATGG 720
D R F S S S S I Q D V I G S I V K K N G

721 ATATGTCGGGTAAATGAGGGGGTGGATTCCCAGAATGCTATTTTCATGCTCCTGCTGCAGC 780
Y V G L M R G W I P R M L F H A P A A A

781 AATCTGCTGGTCTACTTATGAAGCCTCCAAAACATTCTTTCAAAAACCTCAATGAGAGCAA 840
I C W S T Y E A S K T F F Q K L N E S N

841 TAGCAACAGCTCAGTTACCTAAGATTTTCATATGTTTTTGTGCTCTACTAGGCTTATCCA 900
S N S S V T *

901 AAATCATGTCGATTGGTTTCACTTCACCACAGTTGCCATGAACAACCTCAAAGCATCGAAT 960
961 TTTACATGTATATTATGCAATCTAGATGCTTCTTGATATTTATTTTATTTTCTTTTC 1020
1021 CAACTTTTGTAATTAGAATTAGCTACTATGGTTATGGCATGGAGTGTTTATAATTGCTA 1080
1081 ATATCATCGTATAAGCAATGCTATTTGAGAAATTGTGCTGTAAGGTTAGAGTAATGTTAT 1140
1141 TTGCACAATCCACTTACATAGACCGCGGGACTCATTTAAAAAAAAAAAAAAAAAAAA 1195

Figure 8

1 GATCTTTATAT TGAAGATTA AAGTTTCAAA TTACTTTGATA TGTAACTCTC AACAAATCA AGCTTTGAT CATATAAATC GAAACCAACA CACAAATAT
 101 ATGAATTTCT TGGACTCTTT GGCCTCTGTAC CAAATATGGC ACACCAACAA AATTTCTTTT TGTATATAT TCGTTTTT TTTTTTAA GTTTTGGTAT
 201 TCNAACATCA TATAGCTAAG GGGGAATAT ATTGGGACTC CTCCAATAAC TTATGACATT GTGATTACAC ATTGATGA CAGAAGTTT TGAATGAAGTG
 301 CCAATATCA TCTTTTCTTA ATTGCTTCAT AAGGGGTTT TTGTAAATA AAGAAGATAT AAGGAATTT AGCAAGAGT GCATTATTGG GACTGGTATA
 401 TATGACAAAG ATCTGACGTC GAAAGGAAG AAGTGGGTC CTGAGTCAGG TGTGTCCTAT CTGTCAATAT TCTTCAAAAG AGAGTCCACC ATCTCATAGA
 501 TGAATTTAG AAGTGGTTT CCACMAANA ATATGACACA ACCCATCCAT GAACCAATAA AATCATGACA GGTATCATT TCTTCTAT TTTTCTCTC
 601 AAGATATAA TACTATTAG TGTCTTTAAC ACCGGCTTA CTTTGCATT CTTGTCAATT GGTGACTTTT TATTTCCCAA TGTGGGCTG AAGGAATAA
 701 AAGGAAAGT CTTTTCTTG AATCCATATG GAAACAAATT CAATGAGAGA CATNAGAGG AAGATGAGG ATTGAGGAG AGAATTTGTA CAGATCTTCT
 801 TTAAATGGTA TATGTAAATC ACTCAGAAAC AGTATACCA TATATGATC AATGTCAATG TCACAGAAAA CGTAACTCAC GAACACATTT CGTACATGTC
 901 ATGCAACCAAT CATACATAT AACAATATGT TACGACATA AAGATCTTT AGTCGTAAGA GCATGAGCTC GTGACAGAAA CAAAACGGTG GATTTCCCAAC
 1001 CTAAGAGAGG GTATATCTTT TATTCAATA TCTACTTTTG ATATGACCTA AACTTGTGT CACCAACAT GTTGAGTACG ATGATATAT GTTGGACTTG
 1101 TGTGGGATGA GAAATATGAT GAGACGTGGC ATTAGTTT TACCGATGTG ATTGGGTAT ATTATGACA ATATAGATA TATAAACTT GAACAAACAA
 1201 ATTCTCTAAC AATTTAAACT ACAAGATAT CTCTCTCTAG AGTAAACT ATATGCTTG AATGCTTG AGTAACTTGA ATATTATAAA ATCTCTGAGA
 1301 AATACCTGGA TCTCTTTT TCGAAGCGAA ATTCCTCTCT TCCAAACACC TTAAACAAAG TAAATTCGT TAGTAAGAT AATTTTGAA TGTATACACA
 1401 AGATGGAATA AAGTCTATG TCTCTCTCTT ACCCACTGC ACMAACACA CAGACACACA TCCAAAGTA GTAGTATGAT TACACACAT TGAANAATAG
 1501 ACCCTCATTA TTTTACCCAC CTCTCTCTGA AAGAATTA CAAACAAAT ACTCTCTCA TTATTATAAA ATATAGTACA TAACTCTATC TCCATCTCAC
 1601 AACTATATAT TTACTATAT GCAAAACATG CTAAACCTTT CTGTATTTCA GTGAATATGT GGTGTCAAT CCAAGATTC TCAATGTGCC CTCTCTCTCT
 1701 CTCTCTCTCT CTCTCTCTCT CCTCTCTCT TCTCTCTCT ATCAACTGA GGGCTTTAGG ACCCTATAT AACTCTCTCT CAATTGATCA TCTCTGTC

4. Putative promoter sequence

Figure 9

1 GATCTTATATTGAGGATGCAAAGTTTCAAATTACCTGATATGTAACCTCTCAACAAATCA 60
61 AGCTTTTGGATCATATAAATCGAAACCAACACACAATAATTATGAATTTCTTTGACTCTTT 120
121 GTCTCTGTACCAAAATACGCACACCACAAAAAATTCCTTTTGTATTATATTCTGTTTTTA 180
181 TTTTTTTAACGTTTTTGGTATTCAAACATCATATAAGTAAGGGGGAATATTATTCTGGACTC 240
241 CTCCAAAACTTATGACATTGTGATTACACATTTGAATGACAGAAGTTTTTGATGAAGTG 300
301 CCAATATCAATCTTTCTTAATTGCTTCATAAAGGGTGTTTTTGTAAATTAAGAAAGAT 360
361 AAGGAAATTTAGCAAGAAGTGCATTATTGGGACTGGTATATATGACAAGGATCTGACGTG 420
421 GCAAAGAAAGAAAGTGGGTCTGAGTCAGGTGTGTCCCATCTGTCAATATTCTTCAAAAG 480
481 AGAGTCCACCATCTCATAGATGAGATTTAGAAAGTGGTTTTCCACAAAAAATATGACACA 540
541 ACCCATCCATGAACCAATAAAAAACATGACAGGTCATCATTTCTTTCTATTTTTTTCTCTC 600
601 AAGATAATAATACCTATTAGTGTCTTTAACACCGGCCTAACTTTGCATTCTTGTCTATT 660
661 GGTGACTTTTTATTGCCCAATTGTGGCTTGAAGGAAATAAAAAGGAAAGTCTTTTTCTTG 720
721 AACCCATATGGAAGCAATTTCAATGAGAGAGATAGAGAGGAGGGATGGAGATTGGGGTGG 780
781 AGAATTGATACGGATCTTCTTTAATTGGTATATGTAAATCACTCAGAAACACGTATACCA 840
841 TATATGCATCAATGTCAATGTCACAGAAAACGTAACCTCAGAACACATTCGTAACATGC 900
901 ATGCACCAATCATACATTATAACATAGTGTTACGACAATAAAAGATCTTTAGTCGTAAGA 960
961 GCATTAGCTCGTGACAAGAACAAAAACGTGGATTCCCAACCTAAAGAAGGGTATATCTTT 1020
1021 TATTCATATATCTACTTTTGATATGACCTAAACCTTGTGTCACCCACAATGTTTCAGTACG 1080
1081 ATCGATAATTGTTTGACTTGTGTGGGATGAGAAAATGTATGAGACTGGCCATTAGTTTTA 1140
1141 GCCGGATGTGATTTGGGTATATTGATGACAATATAAGATATATAAACTTGAACAAAACA 1200
1201 ATTTCTCAACAAATTAACCTACAAGATAATCTCCCTTCAGATGATAAACTAAATGGTAGA 1260
1261 ATATCCGTTGAGTACCCCAATAATTTAAAATCTCCAGCAAATACTGTGATTCCTTTTCT 1320
1321 TCGAAGCGAAATTCCTTCCTTCCAAACACCTTAACAAATGTAAAATTCGTTAGTAAGATT 1380
1381 AAATTTGAAATGATAACACAAGAGTGAATAAAGGTGATGGTCACTACTTACCCAACTGC 1440
1441 ACAAACACACAAGCACACATCCAAAAGTAGTAGTATGATTACACACATTTGAAAAAATG 1500
1501 ACCTCCATTATTTTAGCCACCTCTCTTGTAAGAAAGATTACAAACAAATTACTCCTATCA 1560
1561 TTATTATAAAATAGTAGCATAACCTCATCTCCAATCCACACCATATATTTTACATTATT 1620
1621 GCCAAACATGCTAAAAGCTTCTTGATTTCAGTGAAATGTGGTGTCAAATCCCAAGATTC 1680
1681 TTCATGTGCCCT 1740
1741 ATCAACTTGAGGGCTTTAGGACCTCTATATAAACCCTCTCTCAATTGATCATCTCTGCATC 1800
1801 ACACCTCTCAAGCATTCTTTCTCTCTACTTTCTTTTAGGTCAACTACACTTCCCTTTGAGT 1860
1861 TTCCAATGGCCACTGTTGAGGTAAATCAAGTGATATATACATAAATTTTATTGAAAGAT 1920

M A T V E

1921 GATTGATTCAAAGAGAACCCTTTTGTGTTTTCTTTAATAAGATCCATGTATATGAAGTTT 1980
1981 TAATGTTTCATGTTTTTTTATTTTTTGTAAATTTTTTTTAAATTTAGGCATTTTTGCAAT 2040
2041 ATCCCATTTGTGAAAAGATCTGTTTTCTTTTGGAAAGAGATTAGAATTCGTTTCGTGTCGA 2100
2101 TTCATCATGAAAATCAATCTGGGTCTAGCTTTAATTGTGCTGATCTTGACCGGACTGTTA 2160
2161 GATGATTCGTTTTATATGTAGGCCCAATAGAGAGTGATAGTATCCCGAAATAATACAAA 2220
2221 TCCGAGCAAACCTATAATCCTCAATAGTAACTTTGTAATCTCTAAATAATCAAAAAATAAT 2280
2281 GCTTATTGGGGTGATTGGTGTGTTTGATGCAGGTTGTATCAGCGCAGACAGCATTCCAAG 2340

V V S A Q T A F Q E

2341 AGGAAAAAAACATGATCAAGAAGTAATTACTACAAAAGAGGAAGCTGTAGTAGTAAGTG 2400
E K K H D Q E V I T T K E E A V V V T A

2401 CACCACCACCATCAGAAACAGCAGAGCCAGCTGCAGCTGTTGTTGCCGAGGAAGAGACAA 2460
P P P S E T A E P A A A V V A E E E T T

2461 CAAAGGAGCAAGAAGAGCCGCCAGCAGTATCGGCCGAGGAACCTGTGGCCCCAGCTGAAG 2520
K E Q E E P P A V S A E E P V A P A E V

2521 TAGAGACAAAGGTGGAAGTTACAGAAGAACCACCAAAAGTTGAGGAGAAACCAGCAGAAG 2580
E T K V E V T E E P P K V E E K P A E V

2581 TAGAGGAGGCTCCAAAGGAAACAGTAGAAACAGAACCAGCTGTTGAGAAGACCATCAAGG 2640
E E A P K E T V E T E P A T E K T I K E

2641 AGGAAACTGTAGAGGACTCTGTCGTGGCACCTGCTCCCGAACCGGAAGCCGAAGTCCCAA 2700
E T V E D S V V A P A P E P E A E V P K
2701 AAGAGAAGGTAATTGCTACTACTGAACTACTGAGGAAGAAGAAAAAGTGGCAGTTGAAG 2760
E K V I A T T E T T E E E E K V A V E E
2761 AAGTTGAAGTGAAAGTTGAAACAGAGGAGGGAGAAGTTACTGAGGAGAAGACTGAGTAA 2820
V E V K V E T E E G E V T E E K T E *
2821 ATAAGTTGTACAACCTATTTTATGCACGCCTTATTTTCTCAATTGGAAGTTTATAATGTAG 2880
2881 TGGGCTTTTGGTAATATTTGGGGGTTTAATAAGTGGTTTAAGTGGGTTAAGGCTTTTTTG 2940
2941 GAATTTAGATATTTGGGTAAAGGCCTACTTGAACAAAACATAGAAATTTGGCACACATGG 3000
3001 GTAAAAGTCAAACCTTTGTTGAGGATGTTTTCTTGTTGGTTAAATGTGTGTGCCAAGTAGT 3060
3061 AGAATGTGGTGGTTGTAATGTAAGTTCTCAAGTAGGGTTTATGAGTCCTAGTATTATGCT 3120
3121 TGATTGTATGTTGATATGAAAATGGGGGTATGTTGGCTTTGATAAAAGTTTTTAATTTT 3180
3181 ATATAATAAGTGTATTTTTGTTTAATATCATTCTTTCATTCTCTCGGATCAACTACTGAT 3240
3241 CATCGCCTTGGTAAAGCTATTGCCTCACCAACTAGCTAATCGAACGCGAGCCC 3292

Figure 10

INTERNATIONAL SEARCH REPORT

Int. Application No
PCT/EP 96/04807

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C12N15/82 C12N5/10 A01H5/00 C07K14/415

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N A01H C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PLANT CELL TISSUE ORGAN CULT., vol. 24, 1991, pages 91-95, XP000618648 J. GRAHAM AND R.J. MCNICOL: "Regeneration and transformation of Ribes" see the whole document.	1
A	--- WO 94 21794 A (ZENECA LTD.) 29 September 1994 see pages 2-8. -----	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

6 March 1997

Date of mailing of the international search report

25. 03. 97

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Authorized officer

Yeats, S

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int	onal Application No
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PCT/EP 96/04807

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		JP 8507923 T	27-08-96
